Aerospace Engineer, GS- 0861-15

AST- Aerospace Flight Systems, NCC: 725-12

Position Number: GS04F01

Introductory Statement: As a senior authority in the management and development of flight instrument systems, the Instrument Systems Manager (ISM) is responsible for overall leadership, and technical and programmatic direction and management of one or more assigned major flight instrument developments through the mission life cycle including formulation, preliminary and critical design, integration and test, and launch and mission operations. The ISM guides and directs multi-disciplinary teams in the engineering and integration efforts for projects and/or programs involving space and aeronautical flight systems, including design and operational requirements definition, hardware and/or software development, testing, verification, safety, integration, certification and operations. The ISM manages instrument requirements, budget, cost, schedule, and technical aspects including risk management of the project/program. The ISM is directly responsible to the Project Manager for the successful development, technical coordination, mission integration, and flight operation of assigned instruments in an affordable and timely manner. Three essential elements of this responsibility are the establishment and maintenance of effective coordinating dialogue between the instrument teams and the supporting Project elements, the effective development, coordination and subsequent execution of technical and programmatic plans, and the effective and timely identification and resolution of technical and programmatic problems and issues.

The incumbent serves as the authoritative managing point of contact between the instrument teams, including their associated Principal Investigators (PIs), and the GSFC Project Office. As required, the ISM also facilitates and maintains the interfaces between the assigned instrument teams and GSFC management and Headquarters for instrument development coordination. A major responsibility of the incumbent is to routinely coordinate, manage and reconcile the needs and requirements of the Principal Investigators, Project representatives, and Headquarters to formulate, define and establish essential instrument requirements assuring compatibility among scientific objectives, technological feasibility, spacecraft interfaces, cost, and schedule constraints.
The specific duties and skill requirements of the Instrument Systems Manager are:

Aerospace Engineering Project Management Work 50%

Manages overall development efforts for a significant end product or a major subject-matter entity of extensive scope and variety. In particular, coordinates and manages overall development and mission integration efforts for the assigned flight instruments of affiliated GSFC Flight Project. Makes substantial and continuing contribution to long-range Project planning and to the formulation, modification, and determination of overall objectives for these flight instrument development efforts. Serves as an authoritative source to the Project Manager of the affiliated Flight Project for instrument technical and programmatic decisions and guidance concerning changes, and impact of changes, in program objectives relating to the management of the total project effort. Coordinates with other Project elements to establish and monitor content, cost, schedule requirements for required products, deliverables, and services. Interacts with Project and Center senior management to formulate agreements and plans for institutional support of Project activities related to flight instrument development.

Assumes a leading role in developing and conducting an effective oversight strategy for the design, development and mission integration of assigned instruments and for the effective and timely evaluation of instrument development progress and performance, including scheduled Project/Program reviews. Makes decisions and recommendations to redirect instrument team and in-house Project efforts to satisfy authorized changes to mission requirements and priorities, including budget and schedules changes if necessary. Plans, guides, coordinates, and manages the work of matrixed Instrument Manager and technical discipline resources required to augment span of control and oversight. Performs periodic review and evaluation of instrument team progress and performance to assess achievement of and compliance with Project programmatic and technical requirements. Prepares, or coordinates, necessary reports, analyses and presentations required for coordination, communication, correspondence, documentation or meeting presentations, including management, peer and technical reviews.

Supports mission requirements and initiates design and modification efforts as necessary. Applies innovation and originality to solve difficult and complex technical, project management, and organizational problems in an area of rapidly changing technology linked to an ever-changing economic environment.

Aerospace and Aeronautical Flight Systems Analysis and Development 30%

Serves as a recognized engineering expert, technical authority, and technical advisor/consultant to agency management, other government agencies, and the aerospace industry on flight systems. In particular, instrument flight systems.

Coordinates and directs engineering and integration efforts for projects and/or programs involving space and aeronautical flight systems and/or payloads, including design and operational requirements definition, hardware and/or software development, testing, verification, safety, integration, certification and operations. Manages and monitors cost, schedule, and technical aspects including risk management of the instrument development efforts for the project/program. Manages multi-disciplinary teams in the design, development, integration, test, evaluation, operation, and long-term maintenance of flight payload hardware, software, and associated systems. Monitors and guides contractors engaged in this work. Oversees and directs the development and design of new and complex aerospace and aeronautical flight technology, equipment, or systems that result in major advancement in the state-of-the-art of broad technologies. Evaluates proposals for flight systems and provides technical management and direction of contracts. May serve as a decision-maker on various panels, conferences, working groups, and technical committees. Actively supports Project change control and management, and coordinates and directs trade-off studies and problem resolution efforts, ensuring all relevant factors are considered including cost and schedule constraints or impacts. Develops or guides the determination of required work-around plans to mitigate instrument technical, cost and schedule problems, issues or risks. Coordinates and reconciles the effective interface accommodation of the instruments on the spacecraft platform.

Directs and guides the planning and coordination of instrument test plans and procedures during instrument integration with the spacecraft and during initial in-orbit instrument checkout

during instrument integration with the spacecraft and during initial in-orbit instrument checkout. Assures that adequate test procedures are prepared for pre- and post-delivery testing of the instruments, including effective testing of embedded components, subsystems and flight software. Ensures the instrument test plans adequately demonstrate and validate science performance requirements consistent with the constraints of the available test environment.

Performs Technical Contractor Oversight of Aerospace Engineering Activities 20%

Provides authoritative project decisions, programmatic advice, and consultation to contractors on variables and unknowns affecting planning, coordination, and critical aerospace engineering problems with respect to safety, costs, and project performance. Serves as Project authority for the coordination, management and oversight of instrument development activities.

Reviews and evaluates the variety of experience and skills necessary to perform the multifaceted tasks required to implement the instrument programs. This includes evaluating instrument staffing plans and reconciling deficiencies or skill shortages. Prepares and/or directs the preparation of instrument contract Statements of Work and associated performance specifications, which include the required reliability and quality assurance provisions and the technical technical reporting requirements. Continually monitors and appraises the instrument contractor technical and programmatic performance to discern and report onset of problems or significant trends that require timely attention and intercession of instrument and Project management for effective corrective action. Actively participates in the Project's change control process to manage change impact and resultant requirements consistency, including technical evaluation of instrument contract changes. Coordinates, monitors and evaluates instrument teams budget planning and cost history to assure Project attention and to assure consistency with Project maintained master budgets. Manages and/or prepares required instrument contract documentation to support each approved instrument development phase (A/B/C/D and E). Serves as Contracting Officer's Technical Representative for assigned instruments and keeps the Contracting Officer apprised of instrument contractor progress and contract compliance, proposed contract changes and assessment of contractor proposals. Provides guidance and recommendations to the Project Manager and Contracting Officer to sort through inherent complexities and identify viable and affordable alternatives to manage cost and schedule constraints.

OTHER SIGNIFICANT FACTS:

Position requires overnight travel 1-5 nights per month.

Serves as Contracting Officer Technical Representative (COTR).

Serves as technical liaison between the contractor and the Contracting Officer by monitoring the contractor's performance and delivery of the final products and/or services under the contract.

Assures technical proficiency and compliance with the technical provisions of the contract by reviewing and verifying the performance of work by the contractor.

Ensures the contractor complies with the defined Statement of Work or specifications included in the contract. Assists the contractor and the Contracting Officer in interpreting technical requirements of the contract scope of work or specifications.

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Reviews and evaluates the contractor's progress related to expenditures, and recommends approval/disapproval for payment as appropriate.

Recommends and justifies changes desired in scope and/or technical provisions of the contract.

Complies with export control regulations.

Consults with the organization's Export Control Representative (ECR) for assistance and approval of any related export.

Factor 1- 9 Knowledge Required by the Position

Mastery of a range of specialized areas in aerospace engineering sufficient to originate concepts and effect new developments applicable to emerging functions of a national magnitude and with long-term purposes. Typically, this position is recognized as a national or international expert in a specialized area of aerospace engineering.

Knowledge of state-of-the are in scientific instrument development. Ability to apply new developments to problems that are unique or that cannot be solved by generally accepted methods.

Knowledge and understanding of space flight science missions.

Knowledge and understanding of missions scientific requirements and resources available for instrument development.

Ability to apply scientific principles to instrument development. This knowledge is used to define requirements, allocate resources, guide system design, and resolve conflicts.

Detailed knowledge of all support systems and elements such as GSFC quality assurance, mission and data operations, NASA procurement practices, etc.

Knowledge of and ability in planning, scheduling, and allocating resources for instrument ground data systems and software.

Knowledge of all quality assurance testing, practices, and procedures, general safety requirements; launch vehicle safety requirements; and test and calibration equipment limitations to assure scientific instrument performance and measuring capability.

Factor 2- 5 Supervisory Controls

The supervisor provides guidance solely in the form of general legislative, mission, or policy directions and resource constraints. The engineer typically initiates new projects or activities independently and keeps the supervisor informed of progress in planning, coordinating, and implementing the work and resolving conflicts. Recommendations and decisions of the engineer are accepted as technically sound even though final approval may depend on formal action by high-level management. The engineer has the highest degree of independence in seeking optimum technical or policy solutions to problems in the light of current engineering developments. Completed work is broadly reviewed for adherence to mission or legislative direction and for assurance that broad policy or program objectives are fulfilled.

Factor 3- 5 Guidelines

Guidelines are basic legislation and/or broadly stated agency regulations and policy statements. At this level the engineer is a recognized technical authority in the interpretation of such broad guidelines, and must exercise considerable judgment and ingenuity in interpreting and adapting guides that exist; in developing new and improved hypotheses, concepts, or approaches not previously tested or reported; and/or in developing new policies that have the potential to take the organization (and the affected public) in new directions. The ideas, methods and procedures developed are on the cutting edge of technology and often serve as precedents for other scientists, engineers, or policy-makers within or outside the agency.

Factor 4- 6 Complexity

The SDO instruments push the state of the art in solar observation and imaging in the visible and extreme ultraviolet regimes and, as such, present a significant level of technical complexity and sophistication. Work is characterized by broad and intensive efforts involving several kinds of problems where the controlling theory and practices are largely undefined, or where the engineering methods and practices are in a state of development or are extensively affected by advances in technology. Projects involve the full range of situations pertinent to various environments, requiring the development of new or refined methods and application of advanced technology. They may be of such scope and complexity that they require supportive projects, some of which are nonscientific in nature. One SDO instrument relies on a significant engineering and hardware contribution from European colleagues. The engineer must work through the complexities of the international management organization to accomplish the payload goals.

Factor 5- 6 Scope and Effect

The purpose of the work is to plan, develop, and execute major programs, projects, or activities for the agency which are usually of national scope and significance. Engineers often serve as experts or consultants to top level managers within the organization or to a broad consortium of experts and special interest groups who are seeking critical evaluations on problems that require long-range solutions. Actions and recommendations affect broad agency policies, programs and legislative proposals, or have an equivalent effect on other scientifically oriented agencies and organizations on a continuing basis.

Factor 6- 4 Personal Contacts

Contacts are with high ranking officials are diverse and occur within and outside the agency at national and international levels in highly unstructured settings.

Factor 7- 4 Purpose of Contacts

The purpose of contacts is to justify, defend, negotiate, or settle controversial and far-reaching matters through active participation in conferences, meetings or presentations. The persons contacted typically have diverse viewpoints, goals, or objectives, requiring the engineer to achieve a common understanding of the problem and a satisfactory solution by convincing others, arriving at a compromise, or developing suitable alternatives.

Factor 8- 1 Physical Demands

The work is primarily sedentary, although some physical effort may be required, e.g., walking, standing, carrying light items such as manuals or briefcases, or driving or traveling by motor vehicle.

Factor 9- 1 Work Environment

The work environment involves everyday risks or discomforts that require normal safety precautions typical of such places as offices, training rooms, and libraries. The work area is adequately lighted, heated, and ventilated. There may be occasional exposure to moderate risks or discomforts in storage areas or hazardous waste sites.